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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,572	04/06/2001	Takashi Ueno	4786US	6508
24247	7590	07/07/2004	EXAMINER	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			HON, SOW FUN	
			ART UNIT	PAPER NUMBER
			1772	
DATE MAILED: 07/07/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/828,572	<b>Applicant(s)</b> UENO, TAKASHI	
	<b>Examiner</b> Sow-Fun Hon	<b>Art Unit</b> 1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 May 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7, 10-15 and 18-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-15 and 18-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>02/13/04</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/24/04 has been entered.

***Withdrawn Rejections***

2. The 35 U.S.C. 103(a) rejections have been withdrawn due to the new rejections below.

***Rejections Repeated***

3. The obviousness-type double patenting rejection of claims 1, 4 over US 6,514,628 has been repeated for the same reasons previously of record in the Office action dated 11/24/03.
4. The obviousness-type double patenting rejection of claim 30 over US 6,228,457 has been repeated for the same reasons previously of record in the Office action dated 11/24/03.
5. The 35 U.S.C. 102(e) rejection of claims 1-6, 30 as being anticipated by US 6,228,457 has been repeated for the same reasons previously of record in the Office action dated 11/24/03.

***New Rejections***

***Claim Rejections - 35 USC § 103***

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
7. Claims 1-7, 10-11, 13-15, 18-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyoshi et al. (previously cited US 5,667,853), as evidenced by Los Alamos Laboratory (Periodic Table of the Elements).

Fukuyoshi et al. teaches a liquid crystal display device (column 1, lines 5-15) which comprises a reflective (column 8, lines 60-65) wiring electrode (column 1, lines 50-60 and column 3, lines 1-20) formed from a laminate (multilayered) conductive film comprising a silver-based based layer formed of a silver-based metallic element (material) laminated on both sides with a first layer and a second layer of transparent metal oxide (column 2, lines 55-65).

One embodiment of the Ag (silver)-based layer is an alloy of Ag (silver) with 0.1 to 3 atomic percent of Cu (copper) and Au (gold) (column 11, lines 40-50). Fukuyoshi et al. teaches that other elements which can take the place of Cu and Au are Ti (titanium), Al (aluminum), Ni (nickel), Pd (palladium) (column 5, lines 30-45), all of which are equivalent in terms of preventing Ag (silver) migration. While Au is most preferred because it contributes to the stabilization of Ag (column 5, lines 40-50), Cu is added to reduce the cost (column 17, lines 30-40), and Ti is added to increase adhesivity to the oxide layers (column 5, lines 40-45). Fukuyoshi et al. thus teaches the equivalence of Pd to Au, and Ti to Cu in terms of preventing Ag migration, but that each element has other desirable properties. Therefore the replacement of Au with Pd and the replacement of Cu with Ti are alternate embodiments which are the result of routine experimentation for the desired end use.

The amounts of 0.1 atomic percent Cu and 0.1 atomic percent Au translate into 0.06 weight percent Cu and 0.18 percent Au respectively, which are both within the claimed range of 0.1 to 3.0 weight percent, as evidenced by Los Alamos Laboratory which supplies the atomic weight data. The conversion from atomic percent to weight percent is shown in the table on the next page.

Art Unit: 1772

Element	Atomic % * Atomic Wt.	Weight	Weight %
Ag	99.8 * 107.9	10768.42	99.76
Au	0.1 * 197.0	19.7	0.18
Cu	0.1 * 63.55	6.355	0.06

Fukuyoshi et al. teaches the equivalence of Pd with Au (column 5, lines 30-45) in terms of preventing Ag (silver) migration. The table of weight percentages of the individual components of the ternary alloy with Au replaced by Pd is shown below.

Element	Atomic % * Atomic Wt.	Weight	Weight %
Ag	98.8 * 107.9	10617.36	99.84
Pd	0.1 * 106.4	10.64	0.10
Cu	0.1 * 63.55	6.355	0.06

Fukuyoshi et al. teaches that the first transparent layer of metal oxide is formed on the transparent (glass) substrate, the Ag-based layer (silver thin layer) is formed on top of it, and then the second transparent layer of metal oxide is formed on top of the Ag-based layer. The deposition method is sputtering (column 13, lines 35-45). The transparent metal oxide layer is formed of a main component (primary metal oxide) of  $\text{In}_2\text{O}_3$  (indium oxide) (column 4, lines 10-15) with at least one of  $\text{ZrO}_2$ ,  $\text{SiO}_2$ ,  $\text{TiO}_2$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{Nb}_2\text{O}_5$  (a secondary oxide of zirconium, silicon, titanium, tantalum, niobium, chromium) (column 4, lines 40-50). The transparent substrate is formed of glass or plastic resin (column 9, lines 40-55).

Fukuyoshi et al. teaches that the silver layer establishes a high contrast display on the screen (column 2, lines 20-30). One of ordinary skill in the art is familiar with a laptop having a liquid crystal display monitor or a cellular phone with a liquid crystal display panel, both of which qualify as portable terminal devices.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyoshi et al., as evidenced by Los Alamos Laboratory, as applied to claims 1-7, 10-11, 13-15, 18-40 above, and further in view of Gibbons et al. (previously cited US 5,589,280).

Fukuyoshi et al. has been discussed above, and teaches the liquid crystal display device which comprises a reflective wiring electrode formed from a laminate conductive film comprising a reflective silver-based based layer. Fukuyoshi et al. fails to teach that metal in its elemental form instead of the oxide is used as the base layer between the silver-based reflective layer and the substrate.

Gibbons et al. teaches that in reflector films (column 1, lines 5-15), the adhesion to plastic substrates of reflective metals such as Ag (silver), Cu (copper) and Au (gold) (abstract) is improved if a primer layer of a metal is deposited between the two layers (column 2, lines 40-50). Silver is taught to be the preferred reflective metal (column 5, lines 40-50). The adhesion promoting metal is Si(silicon), Ta(tantalum), Ti(titanium), Mo(molybdenum), Cr(chromium) or Al(aluminum) which have to be deposited as metals (column 7, lines 20-35) in order for them to be adhesion-promoting (column 15, lines 1-15) in lieu of the list of metal oxides (column 6, lines 10-45). Gibbons et al. thus teaches that the Si, Ta, Ti, Mo, Cr, Al metals can take the place of the listed metal oxides for

Art Unit: 1772

adhesion of the Ag-based layer to the plastic resin substrate in order to take advantage of their physical properties.

Gibbons et al. is directed to reflectors, and Fukuyoshi et al. is directed to the use of reflectors in a laminate. Hence they are analogous art.

Therefore it would have been obvious to one of ordinary skill in the art to have used the metal adhesion promoters of Gibbons et al. in lieu of the indium oxide base layer of Fukuyoshi et al. in order to obtain a highly reflective and cohesive conductive laminate.

### ***Response to Arguments***

9. Applicant's arguments regarding the obviousness double patenting rejections have been fully considered but they are not persuasive.

10. Applicant argues that neither reference anticipates the lower limit of the indicated range i.e. 0.1 weight percent.

Applicant is respectfully reminded that claim 2 of '628 recites Ag as a main component; 0.5 to 3.0 wt % of Pd and 0.1 to 3.0 wt % of a third element selected from the group consisting of Ta, Ni, is a subset of the presently claimed embodiments.

Likewise, claim 1 of '457 which comprises a thin film of AgPdCu alloy containing 0.5 to 3.0 weight % Pd and 0.1 to 3.0 weight % Cu where Ag is a major component as understood from the specification ('457, column 6, lines 45-70), is a subset of the presently claimed embodiments.

11. Applicant's arguments regarding the 35 U.S.C. 103(a) rejections over Fukuyoshi et al. as the primary reference have been considered but are moot in view of the new



Art Unit: 1772

ground(s) of rejection. However, the arguments which are still valid are addressed below in order to advance prosecution.

12. Applicant argues that Fukuyoshi et al. fails to teach the combination of Ag, as a main component, together with a first metal and a second metal since there appears to be only examples of Ag and Cu combined. Applicant is respectfully apprised that Fukuyoshi et al. does give an example of a ternary alloy of 98.4 atomic percent of Ag, 0.8 atomic percent of Au and 0.8 atomic percent of Cu (column 17, lines 10-25).

13. Applicant argues that Fukuyoshi et al. teaches instead that the combined total of the first metal and the second metal is intended to be within the range of 0.1 and 3.0 atomic percent. The table below shows the weight percentages of the individual components of the ternary alloy of Ag/Pd/Cu, with the substitution of Au by Pd in the ternary alloy of Ag/Au/Cu from the example given by Fukuyoshi et al. (column 17, lines 10-25).

Element	Atomic % * Atomic Wt.	Weight	Weight %
Ag	98.4 * 107.9	10617.36	98.7
Pd	0.8 * 106.4	85.12	0.8
Cu	0.8 * 63.55	50.84	0.5


It can be seen that regardless of what the original intent of Fukuyoshi et al. actually was, due to its teaching of the equivalence of Pd with Au (column 5, lines 30-45), claim 1 of Applicant is met, wherein both 0.8 wt. % Pd and 0.5 wt. % Cu fall within the claimed range of 0.1-3.0 wt.%.

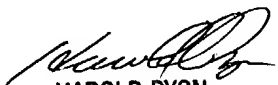
Art Unit: 1772

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Sow-Fun Hon  
06/18/04

  
HAROLD PYON  
SUPERVISORY PATENT EXAMINER  
1772  
6/28/04